That is, third line of (3) say, 67333, 781333, &c. (note $67 = 7 \times 9 + 4$, $781 = 7 \times 111 + 4$), are multiples of 7. We may preface any one of the above series of numbers with, or affix to them, sextets of digits, like or unlike to those of the number we select. I confine my attention to sextets of like figures affixed, as in this way I am able to find what values of n make k a multiple of 7.

The series in (1) is, of course, $n = 1, 7, 13, 19$, and so on: and so for the other sets. The values of n to be taken are:—

for (1), $n = 19, 61, 103, 145, \ldots$

(*i.e.* if we write down 19 3's, we must preface these with a number of the form $7p + 6$.)

(2), $n = 2, 44, 86, 128, \ldots$
(3), $n = 15, 57, 99, 141, \ldots$
(4), $n = 10, 52, 94, 136, \ldots$
(5), $n = 41, 83, 125, 167, \ldots$

University College School. R. TUCKER.

THE BHILS AND THEIR COUNTRY.

IN the current number of the *Asiatic Quarterly Review*, Sir Lepel Griffin has a long and most interesting article on the Bhils, an aboriginal tribe of Central India living in the jungle and rough country around the Vindhya Mountains. Sir Lepel says that for eight years he presided over the province which includes the Bhil country, and he had ample opportunity in that time of studying the habits and language of this interesting people. The people themselves claim that they represent the aboriginal races of India who were forced to retire before the Aryan conquerors. Through their country flows the sacred Nerbudda River with all its Hindu shrines. The Bhils, however, seem to care very little for the Hindu deities; they have been forced by the Hindus, who treat them with profound scorn and contempt, to give a sort of half-hearted acceptance of the chief Hindu deities, but in fact they never worship the gods of their superiors. In one respect, however, they agree with the Hindus, and that is in regarding the Nerbudda with feelings of terror and veneration. From the earliest days of the Aryan conquest of India, the Bhils have been looked on as wild animals, deserving of no protection or kindness. In a few States, such as Barwani and Rajpur, they were so numerous, that their conquerors found it more profitable to tolerate them, keeping them, however, at the same time, in the most abject poverty and subjection. Since the advent of the British Government, the condition of these simple and harmless people has much improved, so that the poor Bhils are gradually becoming less and less savage. Their knowledge of woodcraft and of the habits of birds and beasts makes them invaluable to English officers. Unlike the orthodox Hindu, the Bhil has always eaten the flesh of the cow and the buffalo and other abhorred animals. In fact, he eats every wild animal except the monkey, which is universally worshipped in the form of the forest god Hanumán. The tiger is held in great respect, and the people are very unwilling to kill it, unless it is a man-eater. If a beast has thus become obnoxious, a trial is held with religious rites, and if the animal is found guilty, sentence is passed upon him, he is pursued, killed, and hung up on a tree over the main road as a warning to all evil-doers of his species. It is very curious, and shows the antiquity of this race, that at the coronation of the highest Rajput chiefs, in States where the Bhils live, the sacred mark of kingship is impressed on the forehead of the new chief by the head of the Bhil family to which this hereditary privilege belongs, and the Bhils do not regard him as their king till this ceremony is performed. The Bhils are noted for their endurance, for their capacity of living where others would starve, their indifference to the greatest changes of temperature. Not even to save his life will a Bhil tell a falsehood. Their most solemn oath is by the dog, their most valuable companion in the chase. They are gay and of a light-hearted disposition, and take every opportunity of having a feast and a drinking-bout. Their drink is made from the Mowra, a tree which abounds in Central India, the white flowers of which, when pounded and mixed with grain, form a palatable food, and when distilled by a simple process produce a highly intoxicating spirit. Their priests are not of any particular caste, but the office is an hereditary one. The deities most generally worshipped are the ordinary Vedic deities of water, fire, and the heavens, and each village has its presiding deity, who is a different personage in each village. Like Hindus they burn their dead, except unmarried children of both sexes, who are buried, as also those who die from small-pox. In case of cholera they also bury the dead, believing that the smoke from the pyre disseminates the disease. The dead are worshipped and propitiated by offerings; tree worship is unusual; witchcraft and omens are implicitly believed in; charms of various kinds are universally used.

SCIENTIFIC SERIALS.

THE *Quarterly Journal of Microscopical Science* for April 1889 contains the following:—Contributions to the knowledge of *Amphioxus lanceolatus*, Yarrell, by Prof. E. Ray Lankester, F.R.S. (plates xxxiv.–xxxvi.*b*). Referring to his notes on the anatomy of Amphioxus published in 1875, the author withdraws his confirmation of Johann Müller's statement that there is a pair of apertures on either side of the oral sphincter (velum of Huxley). In reality there are no such apertures at all. Those important structures, described as the "brown funnels," are fully described and excellently illustrated; some few numerical data of importance for the anatomical discussion of Amphioxus are given; some errors which appear to be current as to the existence or non-existence of spaces of one kind or another in the body and gill bars are corrected; and some drawings are given, which represent in a semi-diagrammatic form the structure of Amphioxus, not merely as seen in sections or dissections, with all their obvious drawbacks, but as reconstructed and corrected from the examination of numerous specimens, so that they present as nearly as might be a true conception of the living organism. This excellent paper will be welcomed by all students.—Studies in the embryology of the Echinoderms, by H. Bury (plates xxxvii.–xxxix.). In this memoir the author confines his attention;—to the primary divisions of the cœlom, starting from a stage in which at least two enterocœle pouches are already present;—the hydrocœle; its development and connections;—and to the skeleton, so far as it is developed in the dipleurula stage.—On the ancestral development of the respiratory organs in the Decapodous Crustacea, by Florence Buchanan (plate xl.).

The *Journal* for May 1889 is a special issue, and contains a memoir on the maturation of the ovum in the Cape and New Zealand species of Peripatus, by Lilian Sheldon, Bathurst Student, Newnham (plates i.–iii.). The ovarian structures are fully described in *Peripatus capensis*, *P. balfouri*, and *P. novæ-zealandiæ*. A summary of events in the maturation and fertilization of the ovum in these three species is also given; these are followed by some details of the origin of the ova from the germinal epithelium; the disappearance of the germinal vesicle; the formation of the polar bodies, and the formation of the yolk. Among the many interesting facts mentioned are those in reference to the polar bodies: in *P. novæ-zealandiæ* they appear to be completely absent, but two very prominent bodies are present in the Cape species; they are also in these species exactly similar to one another—a series of facts at variance with Weismann's theories.—With this number is given a series of very valuable indexes: an index to the *Journal* from 1853 to 1888; and one to the Transactions of the Microscopical Society from 1853 to 1868; also to the Proceedings of the Dublin Microscopical Club from 1865 to 1880. These indexes are paged separately, so that they may be bound up as an independent volume.

Engler's Jahrbücher, vol. x., includes the following articles:— The first part of the description of the plants collected by Dr. Marloth in South Africa in 1885–86 (with six plates). The descriptions are prepared by Dr. Engler, with the help of other botanists, and include the Monocotyledons, and Archichlamydeous (Choripetalous and Apetalous) Dicotyledons.—On the anatomical characters of the *Monimiaceæ*, by M. Hobein. This natural order is one as to the position of which various opinions have held; the author's observations strengthen the alliance to Laurineæ, inasmuch as in both orders secretory cells are constantly present.—A monographic review of the species of the genus Primula, by Dr. F. Pax. An attempt to trace the phylogenetic relationships of the species of this large genus.— The second part of the description of Dr. Marloth's plants from

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South Africa (with four plates), including the Gamopetalous Dicotyledons, by Dr. Engler, &c.—The Piperaceæ collected by Lehmann in Guatemala, Costarica, Columbia, and Ecuador, described by Casimir de Candolle.—A new plant belonging to the Olacineæ (*Tetrastylidium Engleri*, Schwacke), by W. Schwacke.—An anatomical study of *Scirpus* and allied genera (with one plate), and a key for distinguishing them on anatomical grounds, by Dr. Ed. Palla.—On some mistaken, or little-known Rubiaceæ of South America, by Karl Schumann.—On the flora of Greenland, by Eug. Warming. Including interesting descriptions of the general appearance of the vegetation, as well as the habit of certain species, with a discussion of the origin and relations of the flora. The author concludes that Greenland is not a European province, from the point of view of botanical geography, but has nearer relations to America.—Contributions to the comparative anatomy of the *Aristolochiaceæ* (with three plates), by Dr. H. Solereder. A comprehensive investigation of the structure of both vegetative and reproductive organs.—The volume also includes the usual personal notices, and abstracts of current literature, together with a list of works recently published on geographical and descriptive botany.

Journal of the Russian Chemical and Physical Society, vol. xxi. No 1.—On hexabromtetramethylene, by A. Sabaneyeff.—On the heat of solution of lithium bromide. It is equal to 11·351, and thus occupies an intermediate position between those of LiCl (8·440) and LiI (14·886).—On the action of ethyl iodide and zinc upon paraldehyde, by W. Wedensky.—On the oxidation of erucic and ricinoleic acids by means of permanganate of potassium, by L. Urvantzoff and W. Dieff.—On the formation of cane-sugar from starch in plants, by F. Selivanoff. It was observed in tubercles of potatoes.—Notes by MM. Moltchanoffsky, Alexeyeff, and Kondakoff.—Theoretical researches into the motion of water in the subsoil, by N. Joukovsky. The author concludes from his mathematical inquiry and some experiments that the law of Darcy remains satisfactory if the secondary causes are also taken into consideration and the results are not extended to great distances from the well. As to the corrections of Darcy's law proposed by Kröber and Smreker, they do not yet correspond to all facts noticed during pumpings.—Note by W. Rosenberg on cyclonic movements.

No. 2.—Yearly reports of the Society.—Notes on primary, secondary, and tertiary nitro-compounds, by J. Bevad.—On the general law of contraction which takes place during the formation of solutions of salts, by A. Gueritch ; second paper, containing data relative to H_2SO_4 and HCN.—On the action of chlorides and hydrochloric acid upon the photochemical decomposition of chlorine-water, by E. Klimenko and G. Pecatoros. They slacken the decomposition.—On the vapour density of ethyl isocyanurate at various temperatures, by S. Krapivine and N. Zelinsky.—On the dilatation of solutions of salts, by N. Tchernay ; third paper, containing tables relative to nine different nitrates.—Note on electrical phenomena due to actinic influences, by J. Borgmann.

IN the *American Meteorological Journal* for March, Mr. A. L. Rotch continues his interesting articles on the meteorological services in Europe, dealing in this number with the Paris and Montsouris Observatories. The interest of the Paris Observatory, from a meteorological point of view, is now chiefly in its long series of observations, which date from the year 1666 ; since the establishment of the Central Meteorological Office, meteorology has not been actively pursued at the Observatory. The Montsouris Observatory was founded in 1871, and deals chiefly with the collection of hygienic statistics, and the application of meteorology to agriculture. It publishes an *Annuaire*, and also a monthly summary in the *Comptes rendus* of the French Academy. Prof. H. A. Hazen contributes an article on anemometer comparisons, and discusses the results of recent experiments in America and in this country, with the view of determining the ratio between the motion of the wind and that of the centre of the cups. The results of the American experiments have been discussed by Prof. Marvin, and will shortly be published *in extenso*. The chief difficulty lies in the determination of a constant factor for all velocities, and of constants for different sizes of cups and arms. Prof. Hazen thinks it possible to construct an anemometer with arms and cups so proportioned as to give a constant factor at all velocities. Lieutenant Finley discusses the frequency of tornadoes in the State of Georgia during the last ninety-four years.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, May 9.—"On the Magnetic Rotation of the Plane of Polarization of Light in doubly refracting Bodies." By A. W. Ward. Communicated by Prof. J. J. Thomson, F.R.S.

In repeating Villari's experiment on the rotation of the plane of polarization of light in a spinning disk of heavy glass, placed with its axis of rotation perpendicular to the lines of force in a magnetic field, it was observed that the incident plane-polarized light became elliptically polarized. The elliptic polarization was due to the centrifugal force, which had the effect of stretching the glass along the radii of the disk and compressing it parallel to the axis of rotation. The strained glass in the magnetic field has, therefore, the double property of elliptically polarizing plane-polarized light, and at the same time rotating the plane of polarization. The strained glass therefore acted like a crystal placed in a magnetic field, and so, before Villari's experiment could be properly interpreted, it is necessary to examine how the elliptic polarization and magnetic rotation affect each other. The following investigation is an attempt to solve this question, and its conclusions show that the apparent magnetic rotation in a doubly refractive medium is a periodic function of the length of the path of light in the medium. This hitherto unsuspected result entirely accounts for the effects observed by Villari, and those observed by Lüdtge in a piece of compressed glass.

Villari's results are very similar to Lüdtge's. Villari, by spinning a disk of glass very rapidly, strained it, and on observing the magnetic rotation found it get less and less as the strain got greater and greater. There is, however, one noticeable difference between Villari's strained disk and Lüdtge's strained prism. The disk was free from strain in the middle; the prism free from strain at the ends.

I have repeated Villari's experiment at the Cavendish Laboratory, using, at Mr. Glazebrook's suggestion, an elliptic analyzer to determine the magnetic rotation. With the disk spinning about 200 times a second, the magnetic rotation was reduced from 10° to 6°. This is not so great a diminution as Villari observed, but his glass may have been softer and more easily strained.

Villari thought that the effect he observed was due to the time required to magnetize the glass. That this supposition was erroneous has been clearly established by the experiments of Bichat and Blondlot, and recently repeated by Dr. Lodge. In these experiments the oscillating discharge of a Leyden jar was found to rotate the plane of polarization in time with the oscillations. Before hearing of these results I had myself attacked the problem in a somewhat similar manner. A coil of wire was wound round a piece of heavy glass, and a current alternated 250 times a second by a tuning-fork was sent through the coil. The current was measured by a dynamometer and a tangent galvanometer. The first gave the measure of the current independently of its sign, the second showed that the integral current was zero. When the current was passing it was found impossible to extinguish the light, owing to the rapid alternations of the plane of polarization.

May 16.—"Physiological Action of the Active Principle of the Seeds of *Abrus precatorius* (Jequirity)." By Sidney Martin, M.D. London, British Medical Association Research Scholar, Assistant Physician to the Victoria Park Chest Hospital ; and R. Norris Wolfenden, M.D. Cantab. (From the Physiological Laboratory, University College, London.) Communicated by E. A. Schäfer, F.R.S.

"The Toxic Action of the Albumose from the Seeds of *Abrus precatorius*." By Sidney Martin, M.D. London, British Medical Association Research Scholar, Assistant Physician to the Victoria Park Chest Hospital. (From the Physiological Laboratory, University College.) Communicated by E. A. Schäfer, F.R.S.

From numerous experiments, the following conclusions were arrived at :—

(1) The poisonous activity of the seeds of *Abrus precatorius*, the jequirity, resides in the two proteids present in the seeds—a paraglobulin and an albumose.

(2) Both of these proteids have practically the same action. They produce severe conjunctivitis when applied to the eye ; and when subcutaneously injected, they cause local inflamma-

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